

Name _____

Date _____

Due Date _____

Mark _____/54

Correct and Hand in Again by _____**Chemistry 11****Hand In Assignment # 13 – Electron Arrangement & Ion Formation**

This Assignment will be marked and you are allowed to do one set of corrections. Show all of your work, including units in your work and answers.

1. According to the Bohr Model of the Atom, (3 marks)

Energy Level 1 hold a maximum of _____ electrons

Energy Level 2 hold a maximum of _____ electrons

Energy Level 3 hold a maximum of _____ electrons

2. Fill in the following table to show how electrons fill up the various levels for the first 18 elements. H and F have been done for you as examples. (16 marks)

Atomic Number	Element Symbol	# of e ^s in Neutral Atom	# of e ^s in Level 1	# of e ^s in Level 2	# of e ^s in Level 3
1	H	1	1	-	-
2	He				
3	Li				
4	Be				
5	B				
6	C				
7	N				
8	O				
9	F	9	2	7	-
10	Ne				
11	Na				
12	Mg				
13	Al				
14	Si				
15	P				
16	S				
17	Cl				
18	Ar				

3. Looking at the results in the table on the last page, it is true that: (4 marks)

The Noble Gas “He” just fills up Level _____

The Noble Gas “Ne” just fills up Level _____

The Noble Gas “Ar” just fills up Level _____

Noble gases are completely non-reactive because their electron arrangements (configurations) are very (*stable/unstable*) _____

4. Elements which are **not** Noble Gases tend to _____ or _____ electrons in order to achieve the same number of electrons as a Noble Gas. (1 mark)
5. NOTE: Elements usually lose or gain a maximum of **3** (three) electrons in order to achieve Noble Gas Stability. (4 marks)
- Elements with 1—3 **more** electrons than the Noble Gas before them on the Periodic Table tend to _____ these extra electrons to achieve Noble Gas Stability.
 - When an atom loses 1 or more electrons without gaining or losing protons, it forms a _____ ively charged Ion.
 - Elements with 1—3 **less** electrons than the Noble Gas just after them on the Periodic Table tend to _____ these “missing” electrons to achieve Noble Gas Stability.
 - When an atom gains 1 or more electrons without gaining or losing protons, it forms a _____ ively charged Ion.
6. Using the table in Question 2 and the facts summarized in questions 3-5, fill in the following table to help you understand how elements form stable ions to achieve Noble Gas Stability. Lithium and Nitrogen have been done for you! (10 marks)

Li	In Group 1	Will lose	1 e ⁻	Forming the ion Li⁺	To have the same # of e ⁻ s as He
Be	In Group	Will	e ⁻ s	Forming the ion	To have the same # of e ⁻ s as
B	In Group	Will	e ⁻ s	Forming the ion	To have the same # of e ⁻ s as
N	In Group 15	Will gain	3 e ⁻ s	Forming the ion N³⁻	To have the same # of e ⁻ s as Ne
O	In Group	Will	e ⁻ s	Forming the ion	To have the same # of e ⁻ s as
F	In Group	Will	e ⁻	Forming the ion	To have the same # of e ⁻ s as
Na	In Group	Will	e ⁻	Forming the ion	To have the same # of e ⁻ s as
Mg	In Group	Will	e ⁻ s	Forming the ion	To have the same # of e ⁻ s as
Al	In Group	Will	e ⁻ s	Forming the ion	To have the same # of e ⁻ s as
P	In Group	Will	e ⁻ s	Forming the ion	To have the same # of e ⁻ s as
S	In Group	Will	e ⁻ s	Forming the ion	To have the same # of e ⁻ s as
Cl	In Group	Will	e ⁻	Forming the ion	To have the same # of e ⁻ s as

7. Using the results of the table in question 6, summarize the formation of ions according to Group Number on the Periodic Table by filling in the following table: (6 marks)

Elements in Group 1	Will Lose 1 e⁻	To Form an ion with a Charge of +1	To achieve Noble Gas Stability
Elements in Group 2	Will	To Form an ion with a Charge of	To achieve Noble Gas Stability
Elements in Group 13	Will	To Form an ion with a Charge of	To achieve Noble Gas Stability
Elements in Group 15	Will	To Form an ion with a Charge of	To achieve Noble Gas Stability
Elements in Group 16	Will	To Form an ion with a Charge of	To achieve Noble Gas Stability
Elements in Group 17	Will	To Form an ion with a Charge of	To achieve Noble Gas Stability
Elements in Group 18	Will	Form _____stable ions because they	Have Noble Gas Stability

8. Elements in Periods 4-7 on the Periodic Table lose and gain electrons in exactly the same way as other elements in their group. For example, Ba (#56) is in Group 2, so Ba will Lose 2 electrons (like other elements in Group 2) and form the stable ion Ba²⁺. Knowing this and using the table in question 7, predict what each of the following elements will do and what stable ions they will form as they reach Noble Gas Stability. (10 marks)

The element Rb	In Group 1 will	Lose 1 e⁻	Forming the ion Rb⁺
The element Te	In Group will		Forming the ion
The element Ga	In Group will		Forming the ion
The element Br	In Group will		Forming the ion
The element Sr	In Group will		Forming the ion
The element As	In Group will		Forming the ion
The element Se	In Group will		Forming the ion
The element K	In Group will		Forming the ion
The element I	In Group will		Forming the ion
The element P	In Group will		Forming the ion
The element B	In Group will		Forming the ion

NOTE: The formation of ions by the elements in the center of the Periodic Table (The Transition Elements and the elements at the bottom (The Lanthanides and the Actinides) is complicated by the presence of electrons in “d” and “f” orbitals and is not covered in Chemistry 11.